

**REMARKS**

Claims 4-8 and 11-13 are pending in this application. By this Amendment, claim 11 is amended; and claim 14 is canceled. Support for the amendments to claims and new claims may be found, for example, in the specification at paragraph [0026] and in the original claims. No new matter is added.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

**I. Rejection under 35 U.S.C. §103(a)**

The Office Action rejects claims 4-8 and 11-14 under 35 U.S.C. §103(a) over Kang (U.S. Patent No. 6,468,718) in view of Mizutani (U.S. Patent Application Publication No. 2003/0198894) or Bonk (U.S. Patent No. 4,731,273 or U.S. Patent No. 4,751,269). By this Amendment, claim 14 is canceled, rendering its rejection moot. As to the remaining claims, Applicants respectfully traverse the rejection.

Independent claim 11 is amended to even more clearly distinguish over the applied references. The applied references fail to teach, suggest, or establish any reason or rationale to provide a process for manufacturing a semiconductor device, including coating an anti-

reflective coating forming composition comprising a resin produced by a condensation reaction between compounds of formula (1), which has a weight average molecular weight of 200 to 500,000, and is contained in an amount of 50 mass% or more in a solid content of the anti-reflective coating forming composition, as required by claim 11.

The Office Action asserts that Kang discloses an anti-reflective layer that comprises a polymer having an anthracene substituent, may have a triazine initiator, and comprises any known crosslinker such as a melamine compound. See Office Action, page 2. However, the Office Action acknowledges that Kang fails to disclose the instantly claimed compound of formula (1), much less a resin produced by a condensation reaction between compounds of formula (1) with a weight average molecular weight of 200 to 500,000, as required by claim 11. Thus, Kang merely teaches an anti-reflective layer and provides very little guidance to achieve the combination features recited in claim 11.

Mizutani merely discloses a resist composition where a vinyl polymer is used and a compound having a urea structure is used as a crosslinking agent for crosslinking the alkali-soluble resin. See Mizutani, paragraph [0245]. There would have been no reason to use the teachings disclosed in Mizutani to arrive at Applicants' independent claim 11 because an anti-reflective coating that is an underlayer of a resist is an entirely different component of a lithography system than the resist itself.

One of ordinary skill in the art would recognize that an antireflection layer does not merely perform the same function as a resist. Thus, the Office Action has failed to provide sufficient factual support for establishing a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately in the applied references.

For example, the composition in Mizutani contains a resin and a crosslinking agent, and has an area dissolved out after exposure to light and development, the crosslinking agent

must not be contained in a high content in order to exert the action and effect as a resist.

Whereas, an anti-reflective coating that is an underlayer of a resist *must not be dissolved* in a solvent for the resist nor in a developer used in the developing step, at the stage where the anti-reflective coating was coated and baked.

As is known to a person having ordinary skill in the art of lithography and described in the instant specification at least at paragraph [0002], the anti-reflective coating is applied "between the photoresist and the substrate to be processed." In this way, the composition of the resist has nothing to do with the composition of the anti-reflective coating. Furthermore, during the use of a mask pattern such as that disclosed in Mizutani, the resist *must be dissolved* in the developer at the stage where the resist was formed on the anti-reflective coating.

At most, it appears that the Office Action may be taking Official Notice that the processes of a resist and an antireflection layer are identical. However, for at least the reasons presented above, the application of Official Notice is neither warranted nor established and thus is improper in this case.

With respect to Official Notice, the MPEP states that "such rejections should be judiciously applied" (see MPEP § 2144.03). "Official notice without documentary evidence to support an [E]xaminer's conclusion is permissible only in some circumstances" (see MPEP § 2144.03(A)). "It would not be appropriate for the [E]xaminer to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known" (see *Id.*, emphasis added). Thus, the Office's apparent attempt to take official notice of the above facts is improper. Accordingly, Applicants respectfully request that the Examiner provide support for the assertions regarding the equivalence of "an antireflection layer" and "a resist," which have led the Examiner to conclude that the claims would have been rendered obvious by the applied

references. Thus, for at least these reasons, Mizutani fails to cures the above deficiencies of the other applied references.

Bonk merely teaches adhesive compositions containing an acrylic polymer as a main component and tetrabutoxy methyl urea or the like as a cross-linking agent. See Bonk, col. 2, lines 59-68 and col. 4 lines 38-53. Thus, for at least these reasons, Bonk fails to cures the above deficiencies of Kang and Mizutani.

Thus, for at least these reasons, the combination of applied references fail to teach, suggest, or establish any reason or rationale to provide "a resin produced by a condensation reaction between compounds of formula (1)" with "a weight average molecular weight of 200 to 500,000" contained in an "amount of 50 mass% or more in a solid content of the anti-reflective coating forming composition," as required by claim 11. Accordingly, for at least the reasons stated above, the Office Action has failed to establish a proper *prima facie* case of obviousness.

Furthermore, patentability is supported by the results disclosed in the specification. Briefly, the instant specification discloses Comparative Examples 1 and 2 and compounds of formula (1) in Examples 1-9. The data present in the specification shows that the dry etching rate is improved in which the structure of compound of formula (1) is repeated. That is, both the dry etching rate and anti-reflection effect is high in the Examples. The Comparative Examples (which used hexamethoxymethylmelamine and tetramethoxymethyl glycol uril) did not result in a high dry etching rate. Such results have not been observed and would not have been expected.

Additionally, the Office Action combines the references based on information gleaned only from Applicants claims and disclosure, which is improper. Therefore, applied references, considered either separately or in combination, fail to teach, suggest, or establish

any reason or rationale to provide the combination of features as recited in claim 11 and thus would not have rendered obvious claim 11.

Accordingly, independent claim 11 would not have been obvious over the applied references for at least the reasons discussed above. Claims 4-8, 12 and 13 depend from claim 11, and also would not have been obvious for at least the reason that independent claim 11 would not have been obvious.

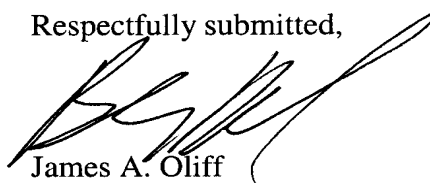
Reconsideration and withdrawal of the rejection are respectfully requested.

### **III. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

Benjamin S. Prebyl  
Registration No. 60,256

JAO:BSP

Date: April 19, 2010

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 320850**  
**Alexandria, Virginia 22320-4850**  
**Telephone: (703) 836-6400**

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